Technical Review Comments
Draft Focused Feasibility Study Report
Dated June 2019
Newtown Creek OU2
July 2019

EPA's comments on the New York City Department of Environmental Protection (NYCDEP) draft Focused Feasibility Study (FFS) report, dated June 2019, are provided below.

Report Comments

General Comments

1. Perform a thorough editorial review and correct issues such as technically questionable language (e.g., use of terms "demonstration" and "manipulated" in reference to the assessments/analyses presented), lack of relevant citations in the text, misplaced information, incorrect callouts for figures, inconsistent use of past, present, or future tense from one sentence to the next, inappropriate use of tense based on context, incorrect use of plural or singular terms, run-on and incomplete sentences, grammatical and punctuation errors, and inconsistent spelling (e.g., use of modelled vs. modeled, waterbodies vs. water bodies). These issues make it difficult to review the document's technical content.

2. The document discusses remedial action levels (RALs), but RALs have not been discussed with the U.S. Environmental Protection Agency (EPA) with respect to Operable Unit (OU) 2. Remove all discussion of RALs.

3. The document discusses conditions and draws conclusions around polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and copper. As EPA previously discussed with NYCDEP during development of the FFS work plan and as the FFS work plan explicitly states, the FFS is to address PAHs, PCBs, dioxins/furans, copper, and lead. These represent the contaminants of potential concern (COPCs) and/or contaminants of potential ecological concern resulting from the baseline human health risk assessment (BHHRA) and the baseline ecological risk assessment (BERA). Revise the document to include dioxins/furans and lead in the various assessments and analyses, or provide justification in the document for why these compounds are not addressed.

4. The terms "urban waterbodies," "urban waterways," "urban R," and "background urban water bodies," among others, are used frequently in the draft FFS report and imply that the reference waterbodies represent general urban conditions. Revise the text to consistently describe the 14 waterbodies alluded to by these terms as the reference areas. Consistent with EPA's position on the OU1 remedial investigation (RI)/feasibility study (FS), use the

term “risk assessment reference areas” for the four areas selected as reference areas for the risk assessments and the term “reference areas” to refer to the other 10 reference areas.

5. There are several instances referencing “development of ARARs” and “developed ARARs.” As was noted during review of the FFS work plan, applicable or relevant and appropriate requirements (ARARs) are identified and not developed. Revise the text to “identification of ARARs” and “identified ARARs.”

6. The document provides substantial information related to COPC sources (e.g., Sections 1.4.4.1, 1.4.4.2, and 1.4.4.3). Much of this detailed information is not relevant or necessary for an FFS that is focused on evaluation and comparison of combined sewer overflow (CSO) control alternatives. A general discussion of COPC sources would provide sufficient context for the FFS. Revise the document accordingly.

7. The simulation periods for the various models are described in a confusing manner in various locations in the text. For example, Sections 5.3.2.1 and 5.3.4.1 refer to simulations for the 2008 and 2011 years, whereas Section 5.3.3.8 refers to simulations over the 2002–2011 period. Review all such occurrences and revise for clarity.

8. The chemical fate and transport model relies on deposition calculated by the sediment transport model to calculate sediment bed contaminant concentrations. Since the chemical model is not subject to a formal chemical calibration, the sediment transport model performance for net sedimentation rates (NSRs) shown in Figure 5-3.1 is the primary metric for assessing the quality of the chemical model performance. The sediment transport model performs well in this regard in the Turning Basin, Dutch Kills, Maspeth Creek, East Branch, and English Kills. However, the model performs relatively poorly for CM 0–2; it underpredicts net sedimentation by a factor of 10 (compared to the lower bound of EPA calibration range) in CM 0–0.5 and by a factor of 2 in CM 0.5–1 and CM 1–2. The key question is whether the model underpredicts the deposition of solids originating from East River or from point sources. The difference in chemical concentrations from the various sources (generally higher concentrations on point source solids than on East River solids) implies a potential bias in chemical model performance originating from the underprediction of NSRs. A graphical presentation of advective and bed-water exchange solids mass fluxes separated by source (i.e. East River, stormwater, and CSO) for the individual reaches shown in Figure 5-3.1 can help answer this question and aid in the assessment of the chemical model results. For instance, a bias toward underpredicting the deposition of solids originating from the East River implies a bias toward higher chemical concentrations in the bed, i.e., a conservative result for the problem of sediment recontamination. This graphic will also provide information on the trapping efficiency of point source solids and will help provide confidence in the comparison of the current average bed concentrations to the various alternatives presented in Section 5.3.4.7. Present and discuss such a graphic in Appendix B along with a discussion of the impact of this bias in NSRs on sediment recontamination in Appendix C and in Section 5.3 in the main body of the document.

9. Revisions made to the text body should also be made to corresponding portions of the executive summary and appendices (and vice versa).

Specific Comments

1. Executive Summary, page ES-1: In the second paragraph on this page, define the Administrative Settlement Agreement and Order on Consent (AOC) for the OU1 RI/FS specifically as the "2011 AOC." In the fourth paragraph on this page, define the AOC for the OU2 FFS as either the "2018 AOC" or the "2018 AOC for OU2." Refer to these two AOCs consistently throughout the document.

2. Executive Summary, page ES-2: In the first paragraph on this page, remove the parenthetical reference to ARARs and Table 3-2 as it is not necessary. Also, revise this paragraph to discuss the relative anticipated timing of the Long Term Control Plan (LTCP) implementation; the OU2 FFS, Proposed Plan (PP), and Record of Decision (ROD) process; and the OU1 RI/FS, PP, ROD, and remedial action process.

3. Executive Summary, page ES-2: In the second paragraph on this page, the summary of the evaluation of alternatives captures some but not all of the threshold and balancing criteria under the National Oil and Hazardous Substances Pollution Contingency Plan. Revise this discussion to include all the threshold and balancing criteria.

4. Executive Summary, page ES-2: Separate the third paragraph into two distinct concepts: the FFS leading to a PP prepared by EPA and public response to the PP and the associated responsiveness summary leading to a ROD prepared by EPA followed by selection of a CSO control alternative by EPA.

5. Executive Summary, page ES-2: In the final paragraph on this page, delete the final sentence regarding the BHHRA and BERA as it is redundant with other information provided elsewhere in the ES, including in the next paragraph on page ES-3.

6. Executive Summary, page ES-3: In the second paragraph on this page, the final sentence "The reference areas provide a comparative basis for remedial activities presented" is not accurate. Reword this sentence to read, "Conditions in the reference areas provide context for evaluating the remedial alternatives considered in this FFS."

7. Executive Summary, page ES-3: The third paragraph states, "The risk assessments show that there is human health risk in both the reference areas and the Site from PCBs and dioxin/furans." Revise this sentence to state, "The risk assessments show that there is human health risk for both the Site and the reference areas from PCBs in fish tissue and from PCBs and dioxin/furans in crab tissue although the concentrations of these COPCs were statistically higher for the Site." Additionally, revise the final sentence in this paragraph to include lead as a risk driver from the BERA as described in the FFS work plan. See general comment #3.

8. Executive Summary, page ES-3: In the section on Current Conditions, include a summary of the number of CSOs in Newtown Creek and the current total annual volumetric CSO discharge.

9. Executive Summary, page ES-4: In the first paragraph, include language that indicates the actions from the Waterbody/Watershed Facility Plan (WWFP) have largely been completed or are under construction. Additionally, in this paragraph, delete the parenthetical reference to ARARs in Table 3-2 and clarify that NYCDEP is under order to implement the LTCP.

10. Executive Summary, page ES-4: Revise the section heading for "Remedial Action Objectives (RAOs)" to be singular (i.e., Remedial Action Objective). Also, the current FFS RAO suggests a sediment remedy and not a CSO control remedy. Reword the RAO to be "minimize, to the extent practicable, inputs of site-identified compounds to Newtown Creek from CSO outfalls that may add contamination to creek sediments."

11. Executive Summary, page ES-4: In the paragraph above Remedial Alternatives/Analysis Summary, the range of copper concentrations in sediments from the reference areas is described as "up to 500 mg/kg". However, Figure 5-1 shows the maximum copper concentration in reference area sediments as below 500 mg/kg. Provide the accurate upper limit of the range of copper concentrations in reference area sediments. Additionally, NYC's use of the phrase "up to" does not define a range of concentrations; revise the text to provide statistics that support an understanding of the distribution of concentrations for each of the contaminants (e.g., minimum, maximum, average).

12. Executive Summary, page ES-5: In the description of Alternative 1 – No Action, revise the text to remove the suggestion that this alternative "is retained" as the FFS selected three alternatives for consideration but did not provide a broader list of potential alternatives from which some were retained. Alternative 1 is included as the baseline condition. In the description of Alternative 3 – 100% CSO Control, it is unclear if the alternative being described is the same as the 100% control alternative from the LTCP, which would only provide 100% control of the four largest CSOs, or an alternative that provides 100% control of all CSOs in Newtown Creek, which is what the alternative is intended to accomplish per prior discussion between EPA and NYCDEP. Rewrite this description for clarity. This comment also applies to Section 4, pages 21 and 22.

13. Executive Summary, pages ES-5 and ES-6: In the descriptions of the lines of evidence (LOEs) under Protection of Human Health and the Environment, more discussion is needed to convey what each LOE was intended to demonstrate and how it supports the conclusions drawn for the evaluation of protectiveness. As written, these summaries are unclear, and it is difficult to determine the point that is being made about protectiveness. For instance, the contaminants summarized under Concentrations of COPCs do not include all risk drivers. Additionally, the average concentration of total polycyclic aromatic hydrocarbons (TPAH) for CSO solids is provided as 31 mg/kg in the ES but as 35 mg/kg in Section 5, and the average concentration of total polychlorinated biphenyls (TPCB) for CSO solids is provided as 0.4 mg/kg in the ES but as 0.47 mg/kg in Section 5. Without discussing all risk drivers, it

is unclear how this evaluation demonstrates protectiveness. Moreover, it is not clear how this Concentrations of COPCs LOE is being framed to support the conclusions offered because no explanation is provided. The discussion for "Contaminant Loadings" is far too simplified, provides no context for how this LOE supports the evaluation of protectiveness, and is not accurate relative to the analyses and figures provided in the document.

14. Executive Summary, page ES-6: Under Compliance with ARARs, delete reference to Table 3-2 as it is not necessary. Under Reduction in Toxicity, Mobility, and Volume through Treatment, indicate that Alternative 3 would provide relatively greater performance. Under Short-Term Effectiveness, include a brief discussion of green and sustainable remediation (GSR) considerations, which could provide a relevant differentiator. Also, under Short-Term Effectiveness, indicate that traffic incidents/accidents would likely be greater for Alternatives 2 and 3 compared to Alternative 1 and for Alternative 3 compared to Alternative 2, and clarify how the LTCP provides information on community impacts for Alternative 3 if the 100% CSO control alternative in the FFS is actually different from the LTCP.

15. Executive Summary, page ES-7: Clarify if the costs provided for Alternative 3 are differential costs and reflect the additional cost necessary to implement 100% CSO control beyond the implementation of Alternative 2. If this is not the case, revise the costs for Alternative 3 to include only the differential costs, and specify what the modifying criteria are. Additionally, define and provide a description of "CERCLA monitoring".

16. Executive Summary, page ES-7: The conclusions section in the ES does not effectively synthesize information to demonstrate the performance of the alternatives under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Rewrite the conclusions section. Delete the final sentence of the ES as it is a verbatim repeat of a sentence on page ES-2 (see specific comment #4).

17. Section 1.2.1, page 2: In the first paragraph of Section 1.2.1 and elsewhere in the document, ensure that the terms Study Area and Site are used properly and not interchangeably. For instance, Figure 1-1 shows the Study Area, not the Site. Revise the text and Figure 1-1 accordingly.

18. Section 1.2.2, page 3: Revise the first sentence in the second paragraph of this section for clarity (i.e., drainage conditions were converted from what condition to being governed largely by engineered systems?). Delete the last sentence in this paragraph. It is not consistent with the rest of the discussion of site history in this section and is covered in more detail in Section 1.4.4.1. In addition, if the intent of the sentence is to provide the rationale for why the site was listed on the National Priorities List, then the discussion in this section is incomplete because it only focuses on one aspect of the site history related to oil spills when there have been many releases other than oil spills throughout the history of the creek.

19. Section 1.3, pages 4 to 8: Reorganize this section to present risks for the Study Area before risks for the reference areas. For the BHHRA, data from the reference areas were appropriately only considered following the assessment of baseline risks for the Study Area and only for Study Area exposure pathways associated with an elevated risk. The attempt to discuss Reference Area risks outside this context and prior to summarizing the Study Area risks results in inaccurate reporting of how the BHHRA considered the reference areas. Ensure consistency with the risk assessment summary information provided in the FFS work plan and other detailed comments below, and ensure that information is provided in the appropriate and relevant sections following reorganization.

20. Section 1.3.1, page 4: Revise the last sentence of the second paragraph of this section consistent with specific comment #6.

21. Section 1.3.1, page 4: In the bullets of the fourth paragraph, the FFS refers to Head of Bay and Gerritsen Creek as having "limited CSOs;" however, these reference areas were selected because they do not have CSOs (i.e., Head of Bay is "industrial without CSOs" and Gerritsen Creek is "non-industrial without CSOs"). Revise the FFS to be consistent with the risk assessments in this regard.

22. Section 1.3.1, page 5: Revise the text in the first paragraph on this page to indicate the important role the reference areas play in evaluating conditions in Newtown Creek (instead of limiting this to evaluating risk in Newtown Creek). In addition, the final sentence of this paragraph indicates "The reference waterbodies represent the physical conditions and processes in the absence of contributions from the Site and so are assumed to represent the contaminant concentrations in media to which the Site will equilibrate after Site sources are controlled and the media that present a risk are remediated." Delete the last portion of this sentence, starting with "and so are assumed to represent…" The overall purpose of the reference areas was to provide a basis for comparison of Newtown Creek data to similar waterbodies not influenced by the site contaminants. It has not been established that it is acceptable to use the reference areas to represent contaminant concentrations to which Newtown Creek site media would equilibrate after sources are controlled.

23. Section 1.3.1.1, page 5: This section is labeled "Baseline Human Health Risk Assessment in Reference Areas," but the first two sentences are specifically about the assessment of risk in the Study Area, not the reference areas. The BHHRA only estimated reference areas risks for fish and crab consumption by recreational anglers and crabbers. Human health risks in the reference areas were not estimated for direct exposure to sediment, surface water, or air and did not include boaters, swimmers, sailboat users, residents, or occupational workers. Move the first two sentences of this section to the beginning of the section summarizing Study Area risks. Replace those sentences in this Reference Area section with "The BHHRA assesses potential risks to human health in the reference areas for those exposure pathways that were associated with an elevated risk in the Study Area: fish and crab consumption by recreational anglers and crabbers."

24. Section 1.3.1.2, page 5: Delete the three bullets. The first bullet is misleading, as there was significant toxicity observed, but toxicity was low compared to the Study Area locations. The second bullet calls Newtown Creek Group's (NCG's) critical body residue (CBR) values "site-specific," but they are no more specific to Newtown Creek than EPA Region 2 CBRs. The difference between the EPA's CBRs and NCG's CBRs is that the NCG values are less conservative than the EPA values. The third bullet states that "The benthic community in the reference areas are consistent with what is found in other urban waterway sediments," but NYCDEP provides no data to support that assertion.

25. Section 1.3.3, page 8: The first paragraph on page 8 pertains to the BHHRA and not the BERA (see specific comment #19). Revise the final two paragraphs of Section 1.3.3 to state that PAHs, PCBs, dioxin/furans, copper, and lead are COPCs from the BERA and that the OU2 FFS assesses these compounds (see general comment #3 and the risk assessment summary from the FFS work plan).

26. Section 1.4.2, page 9: In the second paragraph of this section, provide references for the 1990 Newtown Creek Water Quality Facility Planning Project and the 2003 Final Facility Plan Report.

27. Section 1.4.2, page 9: In the last sentence in the last paragraph on this page, include the percentage of the WWFP green infrastructure projects that have been completed.

28. Section 1.4.3, page 10: In the last sentence of the first paragraph of this section, delete the second portion of the sentence starting with "…the groundwater seeping into the Creek from upland properties…" As currently written, the statement is speculative and is not supported by EPA RI/FS data. In the second paragraph, provide a citation for the "historical dredging information."

29. Section 1.4.4, page 11: The first sentence in this section refers to ebullition as an ongoing source of COPCs. Clarify this sentence. Ebullition itself is not a source; rather, ebullition can facilitate transport of non-aqueous phase liquid (NAPL) and associated COPCs in sediment to surface water. The sentence also refers to groundwater NAPL seeps. This term is not clear and has not been defined. Clarify in the text what is meant by groundwater NAPL seeps. If the sentence is meant to refer to groundwater and NAPL seeps, then a comma is missing between groundwater and NAPL seeps. Revise as appropriate.

30. Section 1.4.4.1, page 11: In the first paragraph of this section, it does not necessarily follow that upland sites are regulated under New York State Department of Environmental Conservation (NYSDEC) Brownfields or former manufactured gas plant (MGP) cleanup programs because there is heavy industrial activity in the area. Revise the fifth sentence in this paragraph to read "Many of the upland sites are regulated under the NYSDEC brownfield or former MGP cleanup programs or the New York State Superfund Program." In the second paragraph, the list of potential pathways from upland sites to the creek is not complete, and terminology used is inconsistent with pathway descriptions in the OU1 RI/FS. Revise the first sentence in the second paragraph of Section 1.4.4.1 as follows: "CERCLA hazardous substances, including the COPCs identified for the Site, can enter the Creek from

the upland properties by runoff during storm events, including overland flow and stormwater discharges, groundwater discharge, and direct releases (spills)."

31. Section 1.4.4.1, page 12: Delete the first paragraph on this page and the associated figures (i.e. Figures 1-4a-y) from the FFS. The information was not collected under the EPA RI/FS and is not consistent with the description in the AOC of the data and reports to be used in the FFS.

32. Section 1.4.4.1, page 12: The second paragraph on this page discusses sites in NYSDEC's spill incidents database and indicates that many oil spills have been documented along Newton Creek in the last 10 years. Table 1-4 provides a partial list of recorded spills at upland sites with NAPL seeps documented along the creek shoreline. Remove this table from the FFS as it includes information (shoreline seeps) that was not collected under the EPA RI/FS and is inconsistent with AOC (see specific comment #31).

33. Section 1.4.4.2, page 12: This section discusses groundwater as an ongoing source of COPCs to the creek. It discusses groundwater COPC concentrations in the native material below the sediment in the creek. Explain why discussion of native groundwater is relevant to the evaluation of remedial alternatives in the FFS and why there is no discussion of COPC concentrations in shallow groundwater (if native groundwater is relevant to evaluating FFS remedial alternatives).

34. Section 1.4.4.3, page 13: The first paragraph on this page discusses concentrations of PAHs and PCBs in NAPL samples collected during the ebullition study. Data collected during the ebullition study events were reported in units of mass per sample, yet the data discussed in this paragraph are in concentration units. Provide the method used to convert the reported PCB and PAH mass results to concentration units in this section and in Table 1-6. State in the text what events the ebullition data discussed in this section were derived from (i.e., the ebullition pilot study, the full-scale ebullition studies, or both).

35. Section 1.4.4.4, page 13: In the first three bullets of the third paragraph of this section, average whole water and particulate phase concentrations for TPAH, TPCB, and copper are summarized for CSOs. The approach to the discussion in the subsequent three bullets related to stormwater and industrial discharges is different from that for the CSOs, focusing on locations with the highest solids concentrations and identifying specific discharges. Revise the last three bullets using an approach parallel to the one used for CSOs (i.e., provide average whole water and particulate phase TPAH, TPCB, and copper concentrations for stormwater and industrial facility discharges).

36. Section 2, page 16: In addition to the colloquial definition of an RAO provided in the first paragraph, provide the RAO definition from the FFS work plan. With respect to the specific RAO provided in Section 2, see specific comment #14. With respect to the concentration range information and RALs provided in the second to last paragraph of this section, see specific comment #11 and general comment #2. As an example of the improper use of tense in the document (see general comment #1), the final paragraph on page 16 suggests that a number of considerations will be taken that have already been completed by way of the FFS.

Revise this final paragraph to read "In accordance with Superfund guidance (USEPA, 1995), reasonably anticipated future land and waterway use in the Study Area was considered during the development of remedial alternatives and will be considered during remedy selection. The RAO above, along with the reasonably anticipated future land and waterway use objectives, has been considered during the evaluation of the remedial alternatives in Section 5."

37. Section 3, page 17: Delete all but the first sentence in Section 3 as this definitional information is covered in the subsections. In addition, throughout Section 3 and all subsections, ensure that "development/developed" is replaced with "identification/identified" as ARARs and To Be Considered information (TBCs) are identified and not developed (see general comment #5).

38. Section 3.1.1, page 18: Delete the second paragraph under Relevant and Appropriate Requirements as it is unnecessary in the consideration of ARARs.

39. Section 3.1.1, page 18: The information presented in the paragraph under Other Information to be Considered suggests that compliance with TBCs is not mandatory as it is with ARARs. Once identified as a guiding TBC in a ROD, a TBC must be incorporated and complied with. Revise the text accordingly.

40. Section 3.1.3, page 19: In the first bullet, delete "for dioxins and PCBs" from after "ambient water quality criteria" as the intent is to describe general examples. In the second bullet, remove the first sentence and replace with "These are restrictions based on the geographical or physical position of the site and its surrounding area. They set restrictions on a remedial action based on locational characteristics including natural and manmade features." In the third bullet, delete "and are primarily used to assess the feasibility of remedial technologies and alternatives."

41. Section 3.1.3.1, page 20: As EPA and NYCDEP have discussed previously, the identification of ARARs in the FFS should include all potential ARARs. The ARARs will be revisited during development of the PP, and final ARARs will be documented in the ROD. Revise the list of ARARs to be comprehensive, including chemical-specific.

42. Section 4, page 21: In the first paragraph of this section, revise the text to indicate that the LTCP screened various CSO control technologies and also assembled suitable technologies into alternatives for consideration. In the second paragraph, describe what is meant by "basin-wide" or revise this to include the appropriate terminology that is otherwise used in the document (e.g., Site, Study Area, creek).

43. Section 5, page 23: The text refers to modeling of site conditions resulting from overflow events. Revise this to be more generic since the model framework includes several contaminant sources to the system, not just CSOs as potentially interpreted by the term "overflow events."

44. Section 5.1, page 23: Clarify that the CSO sampling was performed in Newtown Creek and not in the reference areas where the sediment sampling data that are part of this LOE were derived. In the third paragraph, delete the word "potential" when describing the reference areas. In the bulleted list under the third paragraph, a significantly more developed discussion is needed to support the analysis and conclusions. For each contaminant, consistently provide distributional statistics regarding the data, including averages, ranges, and other information that can be used to interpret the results presented in Figure 5-1. The information provided is inconsistent, with the text citing the maximum TPAH concentration in reference area surface sediment as context but the average and maximum concentrations of TPCB in reference area surface sediment, and the copper bullet overall is difficult to interpret (e.g., it is unclear what "the samples from CSOs of 500 mg/kg" refers to). In the copper bullet, explain to what "other urban areas" refers if these areas are other than the 14 reference areas.

45. Section 5.1, page 24: In the three paragraphs of Section 5.1 on page 24, the analysis presented is confusing and difficult to follow. The first paragraph suggests a direct explanation for lower concentrations of COPCs in sediments in the reference areas compared to CSO discharges from Newtown Creek despite the CSO discharges from Newtown Creek having no direct bearing on sediment concentrations in the reference areas. This paragraph also describes the lower concentrations in the reference area sediments compared to CSO discharges and yet the three bullets in the preceding paragraph (page 23) attempt to frame the CSO solids concentrations and sediment concentrations as essentially the same. The second paragraph of Section 5.1 on page 24 summarizes data for other sites that lacks any true context. For instance, sediment concentrations in sediments near CSOs without information regarding the actual CSO discharge concentrations provide no insight into the relationship between CSO discharges and sediments. However, the conclusion offered in the third paragraph of Section 5.1 on page 24 is reasonable—that in and of themselves, CSO discharges cannot yield sediment concentrations higher than the concentrations on the discharged solids. Revise these paragraphs to clearly and concisely describe how the data provided support this conclusion and how this impacts evaluating the CSO control alternatives provided in the FFS.

46. Section 5.2.2, page 26: In the first paragraph on page 26, the text refers to the annual solid loading from the East River, which was used to derive annual contaminant loads. Include a citation for the annual solid loading information.

47. Section 5.2.3, page 26: Using the atmospheric deposition rate for PAHs from Table C-8 gives a load of 8.6 kg/yr, which is inconsistent with the text in this section and the tabulation in Table 5-3. Review and revise as appropriate.

48. Section 5.2.4, pages 26 to 27: The estimates of loads from other point sources, including MS4s and SPEDES-permitted discharges are summarized in Table 5-4. CSO loads are compared to the other point source loads in Section 5.2.5. Although they are a relatively small fraction of the overall CSO load, explain why the CSOs that will not be addressed by the LTCP are not included in the other point source load estimate.

49. Section 5.2.5, page 27: This section describes the data presented in Figure 5-2, but the conclusions offered in the text are inconsistent, overly generalized (without indicating that they are generalizations), or inaccurate relative to Figure 5-2. The first bullet states definitively that "After implementation of the LTCP (Alternative 2), the TPAH loads would be less than or equal to other background sources" when, in fact, CSO loads would still be (albeit marginally) higher than East River loads. The second bullet does not provide a similar description as the first bullet regarding the comparison of CSO loads to other background sources for Alternative 1 or Alternative 2. Based on information provided in the FFS, CSOs loading inputs currently account for 10.5% of the overall tPAH loading to the study area, 5.5% of the overall tPCB load, and 26.2% of the overall Cu load. These are not insignificant contributions to the contaminant loading of the study area. The third bullet offers no differentiation between Alternative 1 and Alternative 2. The conclusion paragraph following the bullets is overly simplified. Revise this section, the executive summary, and the comparative analysis summary section to present conclusions in a consistent manner and that are substantiated by the data shown in Figure 5-2. Describe the relative meaning of the conclusions with respect to evaluating the CSO control alternatives provided in the FFS. Include a table such as the following which will improve the overall transparency of the FFS.

Annual Loads of COCs To Newtown Creek and Tributaries				
Type	**FFS Source Table**	**TPAH17 (kg/yr)**	**TPCB (kg/yr)**	**Copper (kg/yr)**
East River	5-2	5.5	0.26	223
Atmospheric Deposition	5-3	6.8	0.041	3.4
Combined MS4s	5-4	5.9	1.3	78
Combined SPDES	5-4	110.21	0.114	84.6
Total non-CSO Loads		**128.41**	**1.715**	**389**
Annual CSO Loads - Alternative 1: No Action (Current condition)	5-1	15	0.1	138
Total Loads with CSOs		143.41	1.8149	527
Percent CSO Loading		**10.5%**	**5.5%**	**26.2%**
Annual CSO Loads - Alternative 2: No Further Action	5-1	5.9	0.049	59
Total Loads with CSOs		134.31	1.764	448
Percent CSO Loading		**4.4%**	**2.8%**	**13.2%**

Table compiled by Todd Goeks, NOAA from the June 2019, Draft Focused Feasibility Study Report, Newtown Creek Superfund Site, Operable Unit 2

50. Section 5.3, page 27: The first sentence in this section suggests that contaminant concentrations in the water column were a metric examined as part of the assessment of the impact of CSO discharges. However, the analyses presented in Section 5 and Appendix C only relate to contaminant concentrations in the sediment. Delete the reference to water column from this sentence. In addition, in the assessment of the impact of CSO discharge on the Creek, provide a description or define the assumptions to the statement "after

remediation activities are complete." As written, this sentence implies that modeling was performed to evaluate a condition following the implementation of some real in-creek remedy. The premise of the modeling exercise was to start from an assumed clean sediment condition (i.e., no COPC concentrations in the sediment bed) and not some post-remedy condition (for an OU1 remedy that has not been conceived yet). Revise the text here (and elsewhere) accordingly. Also reword the term "modeling demonstration" as "modeling assessment" or some equivalent (in Section 5.3 and elsewhere). The calculations performed using the models are more definitive and conclusive than suggested by the term demonstration.

51. Section 5.3.1, page 28: In the sixth sentence on this page, the reference to implementation of selected remedial alternatives is confusing because alternatives within the scope of this document refer to the CSO control alternatives rather than the in-creek alternatives referred to in this phrase. Reword the sentence to simplify. As an example, perhaps the analyses can be referred to as an assessment of sediment recontamination potential due to future CSO discharges.

52. Section 5.3.3.2, page 31: In the last sentence in the first paragraph of this section, include citations for the Combination Assessment Reduction Project (CARP) and Gowanus Canal modeling reports.

53. Section 5.3.3.2, page 31: In the last sentence in the second paragraph of this section, include the rationale for using a smaller domain for the sediment transport model.

54. Section 5.3.3.3, page 32: The last sentence in the first paragraph of this section is confusing as it implies that solids from the East River were not included in the model or are not relevant for the system. Revise the text accordingly.

55. Section 5.3.3.4, page 32: In the last bullet on the page, specify the units for the range of total suspended solids (TSS) concentrations included in the sentence. Also, for this bullet, provide a reference or discuss how the TTS concentrations were assigned for these outfalls since they were not specifically discussed in Appendix B.

56. Section 5.3.3.5, page 33: The last sentence of this section is confusing. Given the >10× difference between model-calculated NSR and the lower-bound NSR calibration target in parts of lower Newtown Creek (e.g., CM 0–0.5) and given the lack of sands in the model framework, it is inaccurate to state that the model achieves the USEPA OU1 RI target NSRs in lower Newtown Creek by allowing a small percentage of East River solids that are sand to settle at a faster rate. Revise the text to describe the model setup and performance more accurately.

57. Section 5.3.3.6, page 33: In the second sentence of this section, delete the term "manipulated" and rephrase. Essentially, the text describes a pair of source-tracking simulations designed to separately track the fate and transport of solids from the East River and from point sources. The exact process used to develop inputs for this analysis is not important for including in the document since it is a fairly typical modeling exercise.

58. Section 5.3.3.6, page 33: Given the location of the CSOs being addressed as part of this FFS, include a discussion of the relative proportion of point source and East River solids depositing in Maspeth Creek, English Kills, and the East Branch.

59. Section 5.3.3.7, page 34: In the last sentence of this section, the text refers to the hydrodynamic transport model rather than sediment transport model. Review and revise as appropriate.

60. Section 5.3.4, page 34: In the third sentence of this section, the existing text does not distinguish between the peer review of the model framework versus its application. Revise the text to clarify that the model framework was peer-reviewed as part of its application to a different site. The last sentence in this section indicates that the model calculates the future steady state surface sediment concentration. This does not seem entirely accurate as the model calculates the future time variable rather than steady state surface sediment concentration. Review and revise appropriate.

61. Section 5.3.4.1, pages 34 to 35: Consider including a bulleted list summarizing the assumptions involved in the assessment of sediment recontamination for the various alternatives. These are currently distributed in different sections and include the following:

    a. Assessment under a hypothetical future scenario where the existing sediment contamination in the creek is remediated to zero concentrations—this assumption helps assess the impact of CSO control alternatives specifically and separately from other sources of contamination.
    b. Complete source control for groundwater loadings, ebullition-driven contaminant transport, and NAPL loadings from shorelines and behind bulkheads—this assumption helps assess the impact of CSO control alternatives specifically and separately from other sources of contamination.
    c. Lack of volatilization, degradation, bioturbation, sediment-water dissolved flux, and sediment-sediment dissolved exchange—these assumptions are expected to be conservative with respect to the sediment recontamination assessment that is the focus of this FFS.

62. Section 5.3.4.7, page 36: In the first paragraph of this section, clarify the time horizon and depth interval associated with the presented surface-weighted average concentrations (SWACs) for the three alternatives. Are these SWACs calculated a certain number of years into the future for a given depth-interval in the bed (e.g., top 15 cm), or are they based on the average concentrations associated with depositing solids? Include a tabular summary of the SWAC results presented in Figures 5-3.2 to 5-3.4. This will help to quantify some of the differences between alternatives, which is difficult to interpret from the figures, especially for PCBs. Additionally, consistent with specific comment 11, instead of using the phrase “up to”, provide statistical information that describes the distribution of concentrations for the contaminants.

63. Section 5.3.4.7, page 36: In the final bullet on this page, delete "and govern the current conditions in the creek" from the final sentence.

64. Section 5.3.4.7, page 37: In the first bullet on the page, revise the text to include a discussion of the apparent increase in SWAC from the No Action to the 100% CSO control alternative seen for some of the chemicals, especially for PCBs in the tributaries. The second bullet on this page suggests that model-predicted concentrations are comparable to reference area concentrations, whereas the first bullet on page 36 indicates that model-predicted concentrations are lower than reference area concentrations. Revise the document to consistently describe the data comparisons and ensure that the data comparisons are substantiated by the data and graphics provided. In addition, delete the portion of the last sentence in the final bullet that describes "where the ecological risk is relatively low." As described by EPA previously, the focus of the FFS is not the comparison of model-predicted concentrations to risk in reference areas. Rather, it is the relative comparison of concentrations between alternatives and the comparison of model-predicted concentrations to surface sediment concentrations from reference areas. Make this same revision anywhere in the document where the relative risk is provided as a component of any such conclusion.

65. Section 5.3.4.7, page 37: Add a set of figures showing only SWACs for the three alternatives (do not include the current SWAC), and box and whisker plots of particulate-phase concentrations in CSOs, stormwater sources, East River, and the reference sites. This will help with the key arguments made in the last two bullets in Section 5.3.4.7 and in Section 6.

66. Section 5.4, page 37: Given that the conclusions presented in this section establish the suitability of the CSO control alternatives for consideration under CERCLA, expand the discussion in this section.

    a. The first bullet describes that the COPC concentrations on CSO solids are within the range of sediment concentrations in urban waterbodies in the New York City area, but the summary of the associated data is presented unconvincingly elsewhere in the document. Absent a more robust analysis and presentation of the data, Figure 5-1 demonstrates that COPC concentrations in CSO discharges are actually higher than in reference area sediments. The first bullet also implies that both CSO and other background discharges combined would result in sediment concentrations consistent with reference area conditions, but other arguments in the document are based on a comparison between CSO concentrations and reference area sediment concentrations and separately between loads for CSOs and background sources. The analysis of the information as presented in the document does not support this conclusion.
    b. The second bullet provides a far too simplified discussion of the analysis of contaminant loading to support a conclusion, and this bullet does not describe the actual meaning of the (not entirely accurate) conclusion with respect to an evaluation of CSO control alternatives and their overall suitability under CERCLA.
    c. The third bullet does not provide an actual meaning behind the conclusion in terms of evaluating CSO control alternatives and their overall suitability under CERCLA. This

bullet conflates the comparison of concentration with risk (see specific comment #64). Delete the last sentence in this bullet. The relative magnitude of the current levels of contamination in the creek sediments, ongoing sources, legacy sources, and the efficacy of any future in-creek remedial alternative is beyond the purview of the OU2 FFS.

67. Section 5.4, page 37: Delete the final paragraph in this section. The first sentence in this paragraph belongs in Section 5.3.4.7, and the second sentence expresses a conclusion that belongs in Section 6.

68. Section 6.1.1, page 38: Revise the first sentence of Overall Protection of Human Health and the Environment to state, "The evaluation of the overall protectiveness of an alternative focuses on whether the alternative provides adequate protection of human health and the environment and describes how risks associated with the potential site-specific exposure pathways are mitigated through removal, treatment, engineering, and/or institutional controls." Also note that a complete risk assessment has not been conducted for the reference areas, and risk-based goals are not available for Newtown Creek (OU1). As such, conclusions about the overall protection of human health and the environment, which should describe how risks are mitigated, cannot be made based on a comparison of concentrations to the reference areas or comparison of modeled Newtown Creek concentrations to current conditions. EPA and NYCDEP may need to consider how to reframe the evaluation of this criterion to support the FFS.

69. Section 6.1.2, pages 38 to 39: Revise the first sentence of Long-Term Effectiveness and Permanence to add, "and the permanence of the remedial action." Similar to Overall Protection of Human Health and the Environment, the long-term effectiveness and permanence modifying criterion is intended to evaluate risk, both in terms of risk remaining after response objectives have been met and the ability to maintain risk-protection permanently. Because a complete risk assessment has not been conducted for the reference areas and risk-based goals are not available for Newtown Creek (OU1), conclusions about long-term effectiveness and permanence cannot be made based on a comparison of concentrations to the reference areas or comparison of modeled Newtown Creek concentrations to current conditions. EPA and NYCDEP may need to consider how to reframe the evaluation of this criterion to support the FFS.

70. Section 6.1.2, page 39: For Short-Term Effectiveness, GSR considerations can be a differentiator (e.g., resource consumption, greenhouse gas emissions). Include GSR considerations as a component of the short-term effectiveness criterion. In addition, short-term impacts to the environment itself (Newtown Creek and its surrounding upland areas) should be included in short-term effectiveness.

71. Section 6.2.1, page 40: In the first paragraph of Section 6.2.1, clarify that the previously required projects under the No Action alternative are not related to the LTCP but to requirements under the WWFP. In the last sentence of this paragraph, the CSO control projects are referred to as "these activities," and the sentence states that "these activities"

have been incorporated into “these alternatives.” However, this section is only about No Action; therefore, it seems “these alternatives” should be “this alternative.”

72. Section 6.2.1, page 40: Under Overall Protection of Human Health and the Environment for Alternative 1, the text references “project concentrations of COPCs” and “project contaminant loading of COPCs.” Revise project to projected or otherwise clarify what is meant. Make this same revision for Alternative 2 (Section 6.2.2) and Alternative 3 (6.2.3).

73. Section 6.2.1, pages 40 to 41: Under Overall Protection of Human Health and the Environment for Alternative 1, the three bullets summarize the conclusions related to the LOEs but include summary level information that is not substantiated by the data and information provided. The conclusion from the modeled sediment concentrations is framed around a comparison to reference area sediment concentrations; however, this analysis is not presented in any detail in Section 5, and there are no data tabulations, summaries, or graphics that demonstrate this conclusion. The conclusions are also inappropriately framed in the context of reference area risk and RALs. It is also unclear if the closing paragraph in this section alludes to conclusions related to conditions following implementation of the CSO control actions themselves or some in-creek remediation. Clarify this (and see specific comment #50). This comment also pertains to Alternative 2 (Section 6.2.2) and Alternative 3 (Section 6.2.3). These conclusions and the associated assessment of the alternatives according to this evaluation criterion require substantial revision. EPA suggests that EPA and NYCDEP coordinate a workshop to review the best approach to accomplish the necessary revisions.

74. Section 6.2.1, page 41: Under Long-Term Effectiveness and Permanence, the conclusions for Alternative 1 are framed around a comparison between modeled sediment concentrations in Newtown Creek and reference area sediment concentrations; however, this analysis is not presented in any detail in Section 5, and there are no data tabulations, summaries, or graphics that demonstrate this conclusion. The conclusions are also framed in the context of reference area risk (toxicity), but it is inappropriate to frame conclusions around reference area risk. This same comment applies to Alternative 2 (Section 6.2.2) and Alternative 3 (Section 6.2.3). These conclusions, and the associated assessment of the alternatives according to this evaluation criterion, require substantial revision. EPA suggests that EPA and NYCDEP coordinate a workshop to review the best approach to accomplish the necessary revisions.

75. Section 6.2.1, page 41: Under Short-Term Effectiveness, include discussion of anticipated GSR impacts. This comment also applies to Alternative 2 (Section 6.2.2) and Alternative 3 (Section 6.2.3).

76. Section 6.2.2, pages 42 to 43: Under Short-Term Effectiveness, monitoring is mentioned. If monitoring beyond the LTCP was assumed to be part of Alternative 2, such monitoring should be described in the description of Alternative 2 in the document.

77. Section 6.2.2, page 43: Under Cost, the summary of additional costs for Alternative 2 should be supported by a cost summary table and should include present worth costs.

78. Section 6.2.3, page 43: In the description of Alternative 3, not all CSOs are described and the description is not entirely consistent with the description of this alternative in Section 4. Similar to specific comment #12, it is unclear if the alternative being described is the LTCP 100% control alternative or an alternative that effectively reduces all CSO discharges by 100% (as the 100% control alternative is intended to function). Revise this description accordingly.

79. Section 6.2.3, page 45: Under Cost for Alternative 3, clarify that the provided costs are above and beyond the implementation of the LTCP. As noted in specific comment #77, the summary of costs should be supported by a cost summary table and should include present worth costs. Additionally, revise the text to note that the costs for Alternative 3 being described is the LTCP 100% control alternative (the four major outfalls) and not the cost for an alternative that effectively reduces ALL CSO discharges by 100%.

80. Section 6.3, page 45: Under Overall Protection of Human Health and the Environment, simply specify that all three alternatives would comply. There is likely some comparatively greater level of protection afforded by higher levels of CSO volume control, but because this is a threshold criterion, only the binary conclusion of compliance or noncompliance is necessary.

81. Section 6.3, page 45: Under Compliance with ARARs, there is a definitive statement that Alternative 1 would not comply with ARARs, specifically, Clean Water Act water quality criteria. Reference the analysis that this conclusion is drawn from.

82. Section 6.3, page 45: Under Reduction of Toxicity, Mobility, and Volume through Treatment, clarify that Alternative 3 would provide a higher degree of reduction in toxicity, mobility, and volume of contaminants because it provides a higher level of CSO volume capture and treatment.

83. Section 6.3, page 45: Under Short-Term Effectiveness, provide a comparative evaluation of GSR impacts between the alternatives.

84. Section 6.3, page 47: In the first paragraph on this page, clarify what annual measure it is that is shown in Figures 6-3a through 6-3c, and clarify what SWAC is shown in Figures 6-4a through 6-4c (e.g., is it the creek-wide SWAC?).

85. Section 6.3, Page 47: It would seem that Alternative 2 would in fact be more favorable compared to Alternative 3 when considering GSR impacts (i.e., the increased scale of Alternative 3 would likely yield greater GSR impacts). Update the Conclusion portion of Section 6.3 accordingly. Replace the last sentence in the first paragraph under Conclusion with an objective assessment of the alternative that rates most favorably relative to the evaluation criteria (i.e., a sentence that states “Based on the comparative evaluation, Alternative 2 would comply with the threshold criteria and would provide the most suitable

CSO control approach relative to the balancing criteria."). Provide a table that supports this assessment (i.e., a table showing the comparative ranking of each alternative relative to the evaluation criteria—in other words, an objective scoring of the alternatives based on their relative performance). Revise the final sentence on page 47 consistent with specific comment #4.

86. Section 6.3, pages 45 to 47: EPA suggests that EPA and NYCDEP coordinate a workshop to review the best approach to performing the comparative evaluation of the CSO control alternatives.

87. Table 1-1: All of the waterbodies shown in Table 1-1 should be referred to as reference areas. All references to the four waterbodies as reference areas should be revised to "risk assessment reference areas." Revise Table 1-1 accordingly.

88. Tables 1-3a and 1-3b: These tables appear to be missing the rolled-up data for stormwater and SPDES outfalls as are provided for other categories. Revise the tables accordingly.

89. Table 1-4: Delete this table as it is not necessary to support the document.

90. Table 1-5: Provide a description of the data set and a reference to the locations of the groundwater data as a note to the table.

91. Table 1-6: Provide a description of the data set, how the PCB and PAH mass results were converted to concentration units, and a reference to the locations of the NAPL data as a note to the table.

92. Table 3-1: The following list of permits address activities that may be conducted if a remedial action were taken at the site; therefore, these are action-specific items. Remove from Table 3-1 and add to Table 3-2:
    - USACE Nationwide Permit 38
    - USACE Nationwide Permit 3
    - USACE Nationwide Permit 13
    - SPDES and SPDES Permits

93. Table 3-1: Revise Table 3-1to include the following:
    - Fish and Wildlife Conservation Act (16 U.S. Code 2901 et seq.) (ARAR)
    - Migratory Bird Treaty Act (16 U.S. Code 703 et seq.) (ARAR)
    - Magnuson-Stevens Fishery Conservation and Management Act (ARAR)

94. Figure 5-1: Provide a legend on this figure that indicates what the features on the figure are. Specifically, define the components of the box plots, specify what the green line is, and indicate the difference between black and blue data points. In addition, the vertical axis units for TPCB appear incorrect and should indicate µg/kg rather than mg/kg. Additionally, the text of Section 5.1 does not appear to be consistent with the respective data plots in Figure 5-1. For example, the text of the document indicates that the maximum TPAH value in reference area sediments is 303 mg/kg, whereas Figure 5-1 shows 300 mg/kg. Also, the

average CSO TPAH concentration is approximately 35 mg/kg, as noted, and the respective average for TPAHs in the noted Urban Waterbodies is 15mg/kg. The average CSO TPCB concentration is approximately 0.47 mg/kg, as noted, and the respective average for TPCBs in the noted Urban Waterbodies is 0.24 mg/kg. The average CSO Cu concentration is 292 mg/kg, and the respective average for Cu in the noted Urban Waterbodies is 121 mg/kg. Revise accordingly.

95. Figures 5-3.2 through 5-3.4: Replace the use of "River" with "Creek" in the figure titles and on the x-axes of these figures. In addition, the numbering of these figures suggests some connection to Figure 5-3.1, which there is not. Revise the figure numbering of Figures 5-3.2 through 5-3.4 to be 5-4.1 through 5-4.3 and Figure 5-3.1 to be 5-3.

96. Figures 5-3.5a through 5-3.5c: The naming of these figures implies some connection to preceding figures, which there is not, and the use of a, b, and c is different than the use of .1, .2, and .3 in preceding figures. Revise the figure numbering of Figures 5-3.5a through 5-3.5c to be 5-5.1 through 5-5.3.

97. Figures 6-3a through 6-3c and 6-4a through 6-4c: For consistency among figure naming, revise these figures to be Figures 6-3.1 through 6-3.3 and 6-4.1 through 6-4.3.

Comments on OU2 FFS Report, Appendix A

Specific Comments

1. Section 1, Page A-2, paragraph in section: Revise the text to include the average grid resolution (cell dimensions) within Newtown Creek and its comparison to the OU1 RI grid.

2. Section 1.2, Page A-2, paragraph in section: Revise the text to include bathymetry inputs. Include a new subsection discussing the source of the bathymetry data for the various parts of the domain and key bathymetric features reproduced in model inputs (e.g., continuous navigation channel, shoal at entrance to Newtown Creek) as appropriate.

3. Section 1-4, Page A-5: Revise the text to include a brief discussion of the model calibration process and calibration parameters.

4. Section 1-4, Page A-5, second sentence in first complete paragraph on page: The figure reference is incomplete. Revise accordingly.

5. Section 1-4, Page A-5, second sentence in third complete paragraph on page: The relatively low magnitude of tidal currents is attributed to the channelized, dead-end structure of the creek. However, tidal exchange and the magnitude of tidal currents depend on the tidal prism of the system, which is relatively small compared to other estuaries in New York Harbor, rather than its channelized, dead-end nature. For instance, a channelized, dead-end system that is 10 times longer than Newtown Creek (and of same width/depth) will experience tidal currents at the mouth that are about 10 times higher than in Newtown Creek simply by virtue of the 10× increase in tidal prism. Revise the text to mention the dependence of tidal currents with tidal prism rather than “the channelized, dead-end structure of the Creek.”

Comments on OU2 FFS Report, Appendix B

Specific Comments

1. Section 1.1.3, Page B-5: Revise the text to discuss the rationale for using a smaller grid for NC-STEM than used for the hydrodynamic model described in Appendix A.

2. Section 1.1.4, Page B-7: Some of the terms presented in Eq. 2 are undefined. These include "Grp12," "SiTSS," "PO4TSS," etc. Review and revise as appropriate.

3. Section 1.2.1, Page B-8, first sentence in section: Revise the text to clarify if term "C" represents the same parameter as term "COSS" presented in Section 1.1.4. If so, use a single term for this quantity throughout the document.

4. Section 1.3, Page B-10, bullet items listed in section paragraph: Since the critical shear stress for erosion and the erosion rate constant were specified based on site-specific empirical data and not subject to any adjustment as part of the model application, they should not be considered calibration parameters. Revise the text to delete these parameters from the list of calibration parameters, and only focus the discussion on the two deposition-related parameters that were adjusted as part of the model calibration process.

5. Section 1.3, Page B-10, fourth paragraph in section: Revise the text to clarify how model performance was assessed for calibration purposes. The term "goodness-of-fit" suggests that a quantitative statistical assessment of model results and data was used to assess model calibration, whereas the time-series comparisons presented in Figures B-6 through B-13 suggest a more qualitative graphical assessment of model results and data. If the latter, then reword use of the term "goodness-of-fit" since that has a statistical basis.

6. Section 1.3, Page B-10 and B-11, last paragraph: Delete the reference to and rationale for not using the OU1 RI TSS data. Revise the text to only include a discussion of the data that were used in the development and calibration of the model for the LTCP.

7. Section 1.4, Page B-11, last sentence in first paragraph of section: The referenced sentence suggests the lack of sand transport from the East River into Newtown Creek as the reason for the factor of 10 (compared to the lower bound of EPA calibration range) underprediction in CM 0–0.5 and factor of 2 underprediction in CM 0.5–1 and CM 1–2. However, this is not a plausible explanation for the following reasons:

    a. If the deposition of sand were to explain the 10× difference between model and data in CM 0–0.5, then the sediment bed in this reach should be predominantly sandy, with the grain size distribution expected to show approximately 90% sand content based on the bias between model and data NSRs. Instead, the measured grain size distribution in surficial sediments (top 15 cm; data collected as part of the OU1 RI) shows the opposite—predominantly fine (<63 μm) sediments, with an average fine sediment fraction of about 80%, i.e., sand content of only about 20%. Therefore, the lack of sand

deposition in the model is not a plausible explanation for the 10× bias between the model and data NSRs in CM 0–0.5.

b. The advective transport of sand from the East River into Newtown Creek is expected to be limited to a short stretch near the mouth of Newtown Creek. For instance, a sand particle with a diameter of 70 µm (settling velocity of approximately 250 m/d) located near the surface of the water column (approximately 6 m depth) as it enters Newtown Creek in the middle of the flood tide (coincident with peak current of about 0.15 m/s) will travel about 310 m, or approximately 0.2 mile before depositing to the bed. Furthermore, typical hydrodynamic forces are not high enough to cause subsequent mobilization of sands within the system (either as bedload or suspended load) and transport upstream. Therefore, sand transport from the East River into Newtown Creek and its influence on NSRs is expected to be localized and restricted near the mouth of the creek. Therefore, the lack of sand transport from the East River is not a plausible explanation for the bias between model and data NSRs between CM 0.5–1 and CM 1–2.

Although sand deposition may explain some of the bias between model and data NSRs, the majority of the bias is more likely related to the model parameter settings, specifically, the settling velocity for solids entering from the East River and the critical shear stress for deposition. If the bias between model and data NSRs can more generally be attributed to the lack of adequate deposition of East River solids, then the results of the chemical model may be argued to be conservative with respect to the problem of sediment recontamination that is the focus of the analyses in Section 5.3. Revise the text to provide either quantitative lines of evidence attributing the bias in NSRs to the lack of sands in the model or the additional assessment recommended in one of the general comments to the main body of the report.

Comments on OU2 FFS Report, Appendix C

Specific Comments

1. Page C-4, third sentence in first paragraph on page: The application of this model to Newtown Creek has not been peer-reviewed. Revise the sentence to clarify that the chemical model framework was peer-reviewed as part of its application to a different site.

2. Section 1, Page C-4, third sentence in first paragraph in section: Revise the text to clarify the statement on bed structure. This sentence suggests that the bed was modeled as a single layer, whereas the last sentence in the paragraph suggests that the bed has two layers—an active layer at the bed-water interface and an underlying deep layer.

3. Section 1.1, Page C-4: Revise the definition of term "S as net gain/loss" rather than "net gain" in the definition of terms immediately below Eq. 1.1 and in the first sentence of the paragraph carried over from Page C-4 to C-5.

4. Section 1.2, Page C-6, first sentence in first paragraph in section: Revise the text to clarify that the diffusive flux for the dissolved phase only refers to sediment-water exchange rather than eddy diffusion in the water, which acts on whole-water concentrations as shown in Eq. 1.1.

5. Section 1.2, Page C-6, Eq. 1.6: In the definition of terms from Eq. 1.6, define the units for the term "Rgw."

6. Figures C-1 and C-2: Include a map or some other reference (e.g., creek mileage) relating the grid element numbers to a location within Newtown Creek for the cells with results shown in the individual panels on these figures.

7. Section 4, Page C-13, first paragraph on page: Revise the text to describe how the 20-year simulations were performed. For instance, was the 2008 or 2011 rainfall year loadings/inputs repeated sequentially 20 times?

8. Section 4, Page C-13, first paragraph on page: Revise the text to describe the rationale for assuming 20 years as the time to attain steady-state.

9. Section 4.1, Page C-13, first paragraph in section: The text describes the model grid as "extending to the East River both North and South of the Creek mouth." However, Figure C-3 shows the extent of the grid as being limited to Newtown Creek rather than extending into the East River. Review and revise as appropriate.

10. Section 4.1, Page C-14, second complete bullet on page: Revise the text to include the initial condition used for the deep layer in the model.

11. Section 4.5, Page C-16, second sentence in first paragraph on page: Revise the text to include the reference for the deposition velocity of 0.5 cm/s.

12. Section 4.7, Page C-16: The model results should be described in more detail than is presented in the bulleted list summary. Some patterns/findings that should be discussed are the correlation between predicted sediment contaminant concentrations and source locations (lower in areas influenced by East River and higher in areas influenced by point sources), tributary-specific concentration patterns (generally lower concentrations in Dutch Kills than other tributaries), apparent increase in concentrations for TPCB from No Action to 100% CSO Reduction alternatives, and others. Revise the text to discuss these results and explain the model performance.

13. Section 4.7, Page C-16: Although the steady-state SWACs are presented in the main body of the report, they should be presented in more detail in Appendix C with supporting discussion. The discussion may be combined with the presentation of model results in model detail as noted in Appendix C specific comment #13. Another relevant presentation would be graphics that compare time series of SWACs for individual reaches for the various alternatives. This will also support the use of 20 years as the time to steady-state.

14. Section 4.7, Page C-16, last bullet item in section: Add a set of figures showing only SWACs for the three alternatives and box and whisker plots of concentrations at the reference sites. This will help with the key argument made in this bullet.

15. Section 4.7, Page C-16, last sentence in last bullet item in section: As described by EPA, the focus of the FFS is not the comparison of model-predicted concentrations to risk in reference areas but rather the relative comparison of concentrations among alternatives and the relative comparison of model-predicted concentrations to surface sediment concentrations from reference areas. Revise the text to delete the phrase “where risk was low.”